



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/689,625	10/22/2003	Sang Min Jang	8733.862.00-US	4806
30827	7590	06/29/2005	EXAMINER	
MCKENNA LONG & ALDRIDGE LLP 1900 K STREET, NW WASHINGTON, DC 20006			QI, ZHI QIANG	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 06/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/689,625

Applicant(s)

JANG ET AL.

Examiner

Mike Qi

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 14-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 5-11 is/are rejected.
- 7) ☒ Claim(s) 3,4,12 and 13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of the reply filed on May 4, 2005 is acknowledged.

Claim Objections

1. Claim 5 is objected to because of the following informalities:

Claim 5, recitation "... the first and second organic insulating layer photosensitive resin." Should be changed into - - the first and second organic insulating layer are photosensitive resin. - -

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 6-9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,407,784 B1 (Kanou et al) in view of US 6,784,957 B2 (Kanou et al as Kanou' 957).

Claim 1, Kanou discloses (col.8, line 5 – col.9, line 26; Fig.3) that a method of forming a reflective electrode in a liquid crystal display comprising:

Art Unit: 2871

- depositing a first insulating film (28) (the material of the insulating film is organic insulating film, see col.13, lines 57-65) on a substrate (35A);
- forming a first raised and recessed (peak and depression) layer (25) in the first insulating layer (28);
- depositing a second insulating film (30) (the material of the insulating film is organic insulating film, see col.13, lines 57-65) on the first raised and recessed (peak and depression) layer (25);
- forming second raised and recessed (peak and depression) layer (25A) in second insulating film (30);
- forming a reflective electrode (74) on the first and second raised and recessed (peak and depression) layer (25, 25A).

Kanou does not explicitly disclose that using first mask to form the first peak and depression layer and using second mask to form the second peak and depression layer.

However, Kanou' 957 discloses (col.4, line 64 – col.5, line 13; Fig.34) that using a mask pattern to form the convex/concave (peak and depression) in the insulating film, such as the mask (282) in the Fig.34, that enables to accurately control the shape of the convex/concave pattern and to form a desired convex/concave pattern with a high reproducibility. Inherently, forming different pattern should use different mask pattern, so that using first mask to form first peak and depression layer and using second mask to form second peak and depression layer, and that would have been obvious.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use first mask to form first peak and depression layer and use

Art Unit: 2871

second mask to form second peak and depression layer as claimed in claim 1 for achieving accurately control the shape of the peak and depression pattern so as to form a desired peak and depression pattern with a high reproducibility.

Claims 6-9, lacking limitation is such that the first mask and the second mask having light transmission portion and light reflecting portion, and the mask is transfective mask or diffraction mask.

However, Kanou'957 discloses (col.22, line 51 – col.23, line 15; Fig.34) that using mask (282) having convex/concave pattern and contact pattern, so that the light passing is controlled; and in the contact pattern, the more light passing through; and using such mask having light passing portion and light not passing portion (would be reflecting portion) (i.e., transfective mask) would be possible to simultaneously obtain different etching amounts, so as to simultaneously control the exposure amount to obtain the desired convex/concave pattern (peak and depression pattern).

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use transfective mask having light transmission portion and light reflective portion as claimed in claims 6-9 for achieving simultaneously control the light passing amount so as to obtain the desired peak and depression pattern.

Claim 11, Kanou discloses (col.8, line 5 – col.9, line 26; Fig.3) that a method of forming a reflective electrode in a liquid crystal display in which the plurality of second raised and recessed (peak and depression) layer (25A) overlapped with the first raised and recessed (peak and depression) layer (25), and also overlapped with the raised portion (peaks).

4. Claims 2, 5 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanou and Kanou'957 as applied to claims 1, 6-9 and 11 above, and further in view of Applicant admitted prior art (AAPA).

Claims 2 and 5, lacking limitation is such that the first and second organic insulating layers are photosensitive resin, and the first and second peak and depression layers are softened by a curing bake process to form a plurality of peak patterns.

However, AAPA discloses (paragraphs 0059, 0062) that a conventional reflecting surface with peak and depression structure as shown in Figs.10A to 10E in which using photosensitive resin film to form the peak and depression structure, so that the first and second organic insulating layers are photosensitive resin; and through the curing bake process, the plurality of peak patterns of the photosensitive resin film are softened to form curved patterns of peaks and depressions. Because the curing bake process generates heat, and under the thermal treatment the photosensitive resin are softened that is the property of the photosensitive resin, and that is conventional for obtaining the curved patterns of peaks and depressions.

Claim 10, lacking limitation is such that the first and second peak and depression layers have a plurality of peaks that are randomly arranged.

However, AAPA discloses (paragraphs 0064) that a conventional reflecting surface with peak and depression structure as shown in Figs.10A to 10E in which the peak and depression pattern is formed randomly, so that the peaks are arranged randomly, so as to avoid the interference of the light generated between peaks and depressions, and that is conventional.

Allowable Subject Matter

5. Claims 3-4 and 12-13 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record neither discloses nor teaches that a method of fabricating a reflective plate used in a liquid crystal display comprising various steps as claimed, more specifically, as the following;

forming first and second peak and depression layers having plurality of peaks in which the highest point and the center pints of each of the peaks in the first peak and depression layer are different from the highest point and the center pints of each of the peaks in the second peak and depression layer [claims 3-4, as shown in Fig.15H];

forming first and second peak and depression layers having plurality of peaks in which the peaks in the second peak and depression layer overlapped with portions of the peaks of the first peak and depression layer with a height less than one half height of the peaks of the first peak and depression layer; and the final peak shape having a ratio of a height to a radius of 1:10 [claims 13-14].

The closest references such as US 6,407,784 B1 (Kanou et al) discloses that using two insulating layers to form peak and depression pattern and forming reflective electrode on the peak and depression pattern layers, but the prior art of record do not disclose using the peaks in the two peak and depression layers having different highest point and different center point as claimed in claims 3-4, and the specific overlapping

Art Unit: 2871

portion of the two layers as claimed in claim 12, and forming a final peak shape having height to radius ratio of 1:10 as claimed in claim 13.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

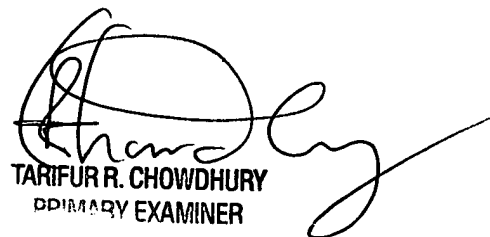
7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (571) 272-2299.

The examiner can normally be reached on M-T 8:00 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mike Qi
June 14, 2005


TARIFUR R. CHOWDHURY
PRIMARY EXAMINER